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Evaluating New England Aquarium's New Strategy for Visitor Engagement: Interpreting Our Mission for a Changing World

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NewKnowledge is a non-profit research institute founded to pursue a deep understanding of how people engage with society's grand challenges. The organization works to expand understanding of how knowledge is acquired and acted upon in order to promote a strong democracy that enables all people to live to their greatest potential in harmony with the biosphere.

Executive Summary

In the past several years, New England Aquarium (NEAq) renewed all exhibits, built new additions, and made substantive efforts to restructure its interpretation strategies to *transform the visitor experience*. With support from the Institute of Museum and Library Services (IMLS) grant #MA-06-12-0143-12, the Aquarium embarked on *A New Strategy for Visitor Engagement: Interpreting our Mission for a Changing World*. From fall 2012 through summer 2014, NEAq developed, implemented, and evaluated a comprehensive approach to increasing the capacity of front-line staff and interpreters to engage with visitors and interpret ocean health according to the Aquarium's mission: *[to combine] education, entertainment, and action to address the most challenging problems facing the oceans*.

To this end, NEAq conducted a baseline survey about visitor satisfaction; performed an inventory of exhibits and the interpretive opportunities offered; developed a training plan based on these findings; then implemented the first wave of training and follow-up practice for front-line staff, their supervisors, and interpretive staff; and pioneered a new interpretive Toolkit—a growing compilation of resources for interpretation.

In spring 2014, New Knowledge Organization Ltd. (NewKnowledge) was commissioned to conduct an independent summative evaluation of project impacts. The evaluation sought to assess the outcomes achieved from the grant-funded effort and to make recommendations that can support the organization as it continues to transform its practices and pedagogical approaches to visitor experiences. The intended outcomes were to:

1. Develop an interpretive approach and training model that is responsive to the Aquarium's audiences and adaptable to new exhibits;
2. Increase visitor satisfaction through personal and positive engagement with interpreters; and
3. Increase integration of the Aquarium's mission into the visitor experience.

The primary audience for the project was the more than 400 staff and volunteers, over 20,000 member households, and the 1.3 million annual visitors they interact with each year.

To understand the outcomes, NewKnowledge assessed the organizational learning and experiential learning impacts of the project.

Organizational Learning

- By April 2014, members of senior administration felt they had achieved substantial progress towards the project's intended impacts and believed the outcomes of the program had the potential to achieve their intended targets. This indicated certain benchmarks for success as well as challenges to date.
- Interviews and surveys with interpretive staff and volunteers, as well as a thorough review of training materials, indicated that the Aquarium made substantial progress toward creating a training program that is adaptable to renovated exhibits and new audiences. This was evident in the robust effort to incorporate tested interpretation techniques, such as *Strategic Framing* in interpretive and training materials like the Toolkit. Overall, following the changes corresponding to project initiatives, Visitor Experience staff members felt that there is a much greater emphasis on protecting the ocean and increasing awareness of ocean-related issues throughout the Aquarium, and that they learned how to interact and engage with visitors more effectively.
- The initiative resulted in increased capability for achieving some of the desired impacts on visitors and members' experience at the Aquarium, such as a strong plan for increasing interactions with visitors at the exhibits and making those interactions more focused on the NEAq initiative to encourage visitors to *Live Blue* and take conservation action.
- The initiative spread learning throughout the organization and as a result expanded the capacity of staff members who work in varying roles across the institution to be aware of and implement mission-based messaging with visitors. The degree to which staff and volunteers were able to use the new techniques and messaging appeared to depend on their roles, with interpretive staff being the most actively engaged in this work. Therefore, the training program appeared to have addressed the variation in capacity and roles across organizational units.

Experiential Learning

- The project resulted in a moderate increase in visitor engagement with NEAq's mission. Most visitors in surveys and interviews recalled learning new animal facts, while fewer could accurately describe NEAq's conservation-based mission. Members, on the other hand, seemed to be more aware of a shift towards mission-based messaging, particularly in membership materials.
- There were several aspects of the current programs that appeared to contribute to positive outcomes. The assessment revealed that the Toolkit was a strong resource to accompany

staff and volunteer training, especially as this process was increasingly professionalized with staff members' additional engagement in professional networks and workshops. The range of interpretive programs might have also contributed to positive outcomes, as it provided ample opportunities to engage different learning styles, group sizes, and interests.

- The assessment identified two environmental conditions that may account for lower success achieving positive outcomes.
 1. Strategic Framing efforts by staff and the alignment of communication with NEAq's mission showed promise. Unfortunately, many staff seemed to struggle with presenting the values as abstractions and inferences that seemed to be separate from the concrete experience visitors were witnessing. This apparent disconnect between a concept and the observed phenomena, when combined with the physical space and sound challenges in the Aquarium's exhibits, limited the degree to which visitors could synthesize or comprehend and repeat back to the evaluators the ideas and recommended actions offered by presenters. This was particularly notable at presentations where the evaluators knew the content, heard the framing offered, but found that visitors made conceptual leaps between random snippets of information because they could not recall what was said immediately before the intercept interview.
 2. The longer format presentations appeared to be structured as a single narrative that builds on foundational content presented at the introduction of the presentations, while most visitors seemed to engage with the presentations for six minutes or less and often did not see the beginning of a presentation. The mismatch between visitor turnover and content structure resulted in some visitors hearing only the set up concepts, and others hearing only the conclusion. Visitors who did not hear the entire presentation appeared to misconstrue mission-based messaging.

RECOMMENDATIONS

As a result of this assessment, NewKnowledge recommends the following next steps to continue the progress made with *A New Strategy for Visitor Engagement*.

- The front-line and interpretive Visitor Experience staff and volunteers should continue to make an ongoing effort to increasingly incorporate language aligned with NEAq's mission and orient conversation toward participatory action.
- Due to limited visitor attention spans and visitor turnover rates, we recommend restructuring longer presentations as a series of segments that each feature distinct, but related, mission-based

messaging. This structure will better accommodate visitors who spend only three or four minutes at a presentation. The new structure would allow visitors attending a full presentation to hear the mission-based messaging articulated in three or four ways, while those choosing to spend only a few minutes may be more likely to hear a full concept before they move on.

- To overcome the environmental challenges of reverberation and noise present throughout the Aquarium—especially for the Giant Ocean Tank and Penguin exhibit—presenters might make efforts to modulate their voices and timing, and may consider working with acting or voice coaches.
- Aquarium members can be engaged more deeply with a concrete focus on local environmental action. It is recommended that new opportunities for engagement with members be identified, perhaps through campaign-based action.
- We suggest that measures of efficacy be anchored to Diffusion of Innovation Theory (Rogers, 2003). In the context of the NEAq mission, the theory suggests that some visitors will arrive prepared to hear the core mission message and are ready to act (Early Adopters or Social Innovators), while others have not contemplated the Aquarium's mission or their role in that mission (Laggards). Development of an audience segmentation strategy based on their belief about the NEAq mission will help identify those who arrive prepared to receive or act on a mission-based message and those who have not contemplated that mission at all. This segmentation strategy will aid in identifying incremental impact for each audience type.

Specifically for staff and volunteer training materials, such as the Toolkit, NewKnowledge recommends:

- Offering more specificity in how to link values in ways that will increase the importance of any one value as part of a larger whole;
- Incorporating the use of similes in narratives to help explain how metaphors work in abstraction for those who tend toward more literal interpretation or struggle with scientific concepts;
- Invoking actionable social norms for small group behavior, noting what small community groups with shared concerns are doing to *Live Blue*. This may be especially appropriate for NEAq membership and frequent visitors who perceive themselves to be "the converted;" and
- Benchmarking learning outcomes against visitor entry narratives, expectations, and values.

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Project Overview

INTRODUCTION

With a mission to combine education, entertainment, and action to address the most challenging problems facing the oceans, the New England Aquarium (NEAq) was awarded support through an Institute of Museum and Library Services (IMLS) grant for an ambitious initiative, *A New Strategy for Visitor Engagement: Interpreting Our Mission for a Changing World*. Through this grant NEAq developed, implemented, and evaluated a comprehensive approach to increase the capacity of the front-line staff and interpreters. This initiative sought to systematically address the need for a new interpretive strategy that aligned with the Aquarium's mission, coincided with the renewal of the exhibit pathway, and engaged changing audiences.

A key priority of NEAq's strategic Action Plan is *to transform the visitor experience* through new exhibits, renovation, interpretive strategies, and graphics. To this end, NEAq opened the New Balance Marine Mammal Center in 2009 and the Trust Family Shark and Ray Touch Tank in 2011. Over the past two years, NEAq completed a renovation and enhancement to their signature Giant Ocean Tank (GOT) and unveiled a new exhibit, the Blue Planet Action Center.

Meanwhile, changing audiences and new institutional communication strategies brought increasing demands for the interpretive staff. Changes in interpretation accompanied the physical transformations taking place at the Aquarium, with the intention of better achieving

the Aquarium's goals through mission-based communication. New Knowledge Organization Ltd. (NewKnowledge), a non-profit research and evaluation organization based in New York City, partnered with NEAq to complete this summative evaluation and address the degree to which the grant goals were met.

Specifically, this grant-funded effort sought to:

1. Develop an interpretive approach and training model that is responsive to our audiences and adaptable to new exhibits;
2. Increase visitor satisfaction through personal and positive engagement with interpreters; and
3. Increase integration of the Aquarium's mission into the visitor experience.

Summative Evaluation

NewKnowledge developed a plan for an independent impact assessment for *A New Strategy for Visitor Engagement*. The plan recommended a 360-degree assessment to evaluate the effect of training staff in mission-based communication. The plan was also designed to determine whether staff had become more informed, confident, and skilled in proactively engaging visitors and applying mission-based interpretation, and to establish evidence of change and effectiveness of the communications methods.

Table 1. Strategies for assessing Visitor Engagement.

Participants	Methods	Areas of Impact
Senior Management	Interviews	Perceptions of training programs as institutionalized and central to the mission; and Changes in staff and volunteer capacity to meet the grant objectives.
Front-line Staff	Interviews Surveys	Perceptions of training programs as institutionalized and central to the mission; Changes in staff and volunteer capacity to meet the grant objectives; and Strengths and challenges of visitor engagement strategies.
	Observations of Interactions Observations of Programs	Changes in staff and volunteer capacity to meet the grant objectives; and Strengths and challenges of visitor engagement strategies.
Visitors and Members	Observations of Interactions Observations of Programs Intercept Interviews Focus Groups	Visible reactions to interactions and programming; Degree to which program content was interpreted and internalized; Knowledge gains; and Perceptions of the new mission-based strategies.
Interpretive Toolkit	Rubric-based Review	Capacity to introduce and guide staff and volunteers in mission-based interpretation; Capacity to meet the grant objectives; and Sustainability and adaptability of the Toolkit.

This summative evaluation also assessed whether NEAq developed a long-term, comprehensive strategy for Visitor Engagement, intended to make the institution more agile and adaptable to changing exhibits and audiences. NewKnowledge aimed to design evaluation activities that resulted in recommendations to support NEAq's institutional growth and change strategy to focus on more flexible approaches to convey their conservation mission to a range of audiences at any exhibit, including those yet to be built.

To address these evaluation questions, the 360-degree assessment consisted of a range of methods, evaluation participants, and areas of impact (see Table 1). The assessment also included a review of a specific training resource, the Interpretive Toolkit, which is an evolving collection of tools and resources for interpretive staff and volunteers to use in exhibit areas with visitors. Table 1 details how all of these parts were integrated into the evaluation efforts.

Certain conditions that affected the data collection should be acknowledged as part of ensuring accurate, valid, and replicable findings. NewKnowledge undertook data collection during the summer season, a time of intense crowds with a high number of both international and domestic tourists whose expectations and reasons for visiting likely differed from Boston residents who frequent the Aquarium on a more regular basis throughout the year.

Interpretation Approaches

Interpretation at the Aquarium occurred in several distinct ways, as observed by the evaluation team. Each method is described below, with specific examples that NewKnowledge focused on during observations, interviews, and focus groups:

1. *Informal Visitor Engagement* consisting of casual interactions generally less than a minute in duration, ranging from ticket sales to answering impromptu questions about animals during feeding. Interactions between visitors and staff were observed in the exhibit galleries, the Shark and Ray Touch Tank and the Edge of the Sea Tide Pool.
2. *Small-Group Interactions* are two-way exchanges between interpretive staff or volunteers and small visitor groups, such as families or school groups, frequently activity-based. NewKnowledge observed interactions at the Blue Planet Action Center (BPAC).
3. *Formal Presentations* are demonstrations or talks of at least 10 minutes in duration, led by one or more interpreters with audio support and a narrative or script for audiences of 50 to 150. Multiple presentations at the Giant Ocean Tank, Penguin exhibit, and the marine mammal pools were observed.



Figure 1. Small group presentation at the BPAC.

Other Data Sources for the Evaluation

In the past, NEAq partnered with evaluators on several evaluation projects. Since spring 2004, the Morey Group of Charleston, South Carolina designed questionnaires for NEAq visitors to answer each season. Survey topics included, but were not limited to demographics, visitor experiences, and environmental concern. In the summer of 2013, the Morey Group worked with New England Marketing Research Group of Danvers, MA to collect over 300 in-person visitor surveys at NEAq. This study attempted to identify visitor characteristics, assess marketing programs, and evaluate visitor experiences, as an in-depth extension of the ongoing annual studies that the More Group conducted. NewKnowledge used these studies to provide background information on NEAq's visitors.

Interpretation at the Aquarium – A Glossary

The interpretive team at NEAq offers a broad range of activities with special features, types of information, and modes of engagement. This glossary describes the modes of engagement discussed in this assessment.

Informal Visitor Engagement

Informal visitor engagement includes the interactions of over 100 front-line staff and volunteers from multiple departments with the visiting public. These interactions are as varied as the NEAq front-line team taking tickets, selling food in the café, or answering impromptu questions while caring for animals. These interactions are generally short and last less than a minute but attitude and knowledge are extremely important in creating a pleasant and informative experience for visitors.

Gallery Interpretation

Interpretation staff are assigned to be in designated exhibit galleries for certain periods to ensure that visitors have access to knowledgeable members of the Aquarium team at all times to answer a variety of questions, ranging from directions (e.g. where are the restrooms?), to schedules (e.g. what time are the seals being fed?), to scientific information (e.g. what do they eat?).

Roving Interpretation

Roving interpreters include staff members and volunteers circulating around exhibit areas or galleries of their choice. Offering staff and volunteers this opportunity for engagement allows for casual interactions whereby specific areas of knowledge and interest are shared with visitors.

Small Group Interactions

Small group interactions refer to two-way communication between interpretive staff or volunteers and small groups of visitors, such as families or school groups. These interactions may engage visitors in hands-on activities or additional discussion to complement the viewing of an exhibit. During this evaluation, over 130 interpretive staff and volunteers could proactively interact with small groups by answering questions, imparting scientific knowledge, and sharing personal stories about individual animals.

Blue Planet Action Center (1st Floor)

In 2013, NEAq opened the Blue Planet Action Center (BPAC), situated at the beginning of the visitor pathway. There, Aquarium visitors could become familiar with core research and conservation initiatives through interactive exhibits and self-guided activities.

Along with the Giant Ocean Tank (GOT), BPAC provided new Aquarium experiences for visitors, showcasing the Aquarium's research and conservation work while guiding them to become part of the solution to global ocean and environmental threats.



Figure 2. Daily scheduled presentations at NEAq.

Climate Change Activities at BPAC

Climate Change (CC) Activities at the BPAC entailed the use of hand-held technological devices by interpreters, such as tablets, or mixed use of biofacts and objects with small groups of fewer than 20 people gathered. The goal of these activities was to explain the science behind climate change.

Family Programs at BPAC

Family Programs at the BPAC encompassed staff and volunteer interaction with young children and their caretakers. Interactions included engaging children in coloring, puzzles, and other hands-on activities. Animal and ocean-themed toys were also used to engage young children in play and appreciation for the ocean and marine life.

Live Animal Programs at BPAC

Live Animal Programs (LAPs) at the BPAC included multiple interpreters presenting small live animals to visitors. Interpreters talked about the specific animal at the aquarium, about their conspecifics in the wild, what threatens their existence, and conservation efforts in effect to help them.

Shark and Ray Touch Tank (1st Floor)

The Shark and Ray Touch Tank (SRTT) is a mangrove exhibit for visitors to learn about and touch tropical sharks and rays. Interpreters taught visitors how to appropriately touch animals and shared related facts. Interpreters could initiate interactions with visitors but visitors often continued the conversation by asking questions or making comments.

Edge of the Sea Touch Tank (3rd Floor)

The Edge of the Sea Touch Tank (EDGE) is a Massachusetts tide pool exhibit for visitors to learn about and touch local marine invertebrates and fish. Interpreters discussed with visitors how to appropriately touch animals and shared relevant animal facts. Interpreters could initiate interactions with visitors but visitors often continued the conversation by asking questions or making comments.

Presentations

Presentations at NEAq engaged large groups through daily scheduled presentations. Interpretive and some husbandry staff provided these experiences at specific exhibits. Presentations tended to be scripted demonstrations that lasted at least 10 minutes, with approximately 50-150 visitors in the audience.

Penguin Presentation

The Penguin Presentation was a 25-minute long presentation given primarily by penguin husbandry staff at the entrance/exit side of the Aquarium, inside the African Penguin pool. This presentation allowed for a Q & A session with the husbandry staff serving as live interpreters.

Giant Ocean Tank Presentation

Last year, NEAq finalized the renovation of their central attraction, the 200,000-gallon Caribbean Coral Reef exhibit, known as the Giant Ocean Tank (GOT). Following ten months of construction, its physical transformation included a bright new coral structure for over 1,000 residents, 52 new windows, new additions to the collection, and mission-based graphic interpretation. Education space at the top of the GOT was expanded with the Yawkey Coral Reef Education Center, which featured interactives, interpretive panels about coral reef conservation, and space for groups to gather for presentations.

The GOT presentation occurred at the top of the tank where visitors could see divers enter the water, and animal care staff feeding and station training the fish and sea turtles.

Marine Mammal Presentations

Marine mammal presentations occurred during the four northern fur seal, sea lion, and four harbor seal training sessions. NEAq's marine mammal trainers delivered these presentations.



Figure 3. Visitor Experience Staff at the Blue Planet Action Center.

Summative Evaluation

STAFF PERSPECTIVES

Overview

The summative evaluation explored various types of interpretation at NEAq, including informal visitor engagement, small-group interaction, and formal presentations. The evaluation featured a 360o assessment using interviews with staff, observation of interactions, signage review, visitor surveys, and an audit of the training Toolkit (a living document nearing completion of its first phase based on IMLS funding support).

In April 2014, NewKnowledge evaluators conducted interviews to assess the degree *to which senior administration staff members believe the outcomes of the grant-funded initiative have achieved their intended targets*, and what they saw as successful or challenging. These interviews provided guidance for subsequent instrument development for the visitor surveys, observations, and the staff surveys.

This section focuses on the interviews and discussions with senior staff members as well as a survey deployed among the Visitor Experience team. The survey questions explored how NEAq staff are implementing their interpreter training in an effort to share the mission of the New England Aquarium as was outlined in the goals of the IMLS-funded Visitor Engagement effort.

Methods

In April 2014, two NewKnowledge researchers visited NEAq to interview members of the senior leadership team and gather reflections from interpreters as representatives of the Visitor Experience team. The interviews were conducted as conversations, guided by a set of questions. Staff also joined NewKnowledge for an informal conversation during a 90-minute lunch session. One senior staff member was interviewed on Skype. In total, 10 people, including four senior staff and six Visitor Engagement staff participated. Notes from the conversations were analyzed and used to develop the Visitor Experience staff survey.

The introductory text in the Visitor Experience staff survey described the three goals for the project as stated in the IMLS grant proposal. Questions in the survey explored staff members' understanding of and perspectives on mission-based communication strategies and staff opinions on the usefulness of signage at the Aquarium. The survey also asked participants to indicate their length of employment, in order to disaggregate data submitted by those who started working at the Aquarium either before or after the IMLS grant was implemented.

Results

Senior Staff

Not surprisingly, senior staff members were very familiar with the goals of the IMLS Visitor Engagement grant-funded initiative. They were enthusiastic about feedback from interpreters and noted a buzz among staff when interacting with visitors as positive signs of progress. Senior staff had a genuine desire to know where changes had occurred and where there might still be obstacles or the potential for misinterpretation of the principles of the initiative.

During the discussions, certain questions surfaced as meriting additional attention: *Do visitors recognize NEAq as having a brand and recognizable mission? Is this something visitors are proud of? Has the rebranding effort brought continuity to the messaging (both internal and external)? Has the Aquarium struck the right balance between entertainment/education in the exhibits? Finally, What does an ocean steward look like, and what are the attributes of a movement (defined as people working collectively toward a common goal)?* These questions were used as underlying questions that were explored in the intercept and focus group evaluations.

Senior staff offered detailed descriptions of the NEAq **investment in professionalizing education**, describing three vectors they ascribed as central for supporting learning at NEAq: first, answering basic questions as a straight forward interaction with visitors; second, mission-based communication – sharing the NEAq mission; and third, the use of a Strategic Framing approach to redirect conversation and presentation toward recommended mission-based action that visitors could pursue following their visit. These findings were consistent with the descriptions of the effort offered by staff, who joined the team for a brown-bag lunch.

During these interviews, it was also confirmed that six of nine full-time educators at the Aquarium are NAI-certified (National Association for Interpretation) and claimed there was *“a sense of alignment”* between NAI and NEAq's Strategic Framing communications. They felt this alignment would increase as NEAq spends more time on details and specifics.

Although the value of Strategic Framing was clear to interviewees, it was also seen as rigorous and challenging. For senior staff, *mission-based interpretation* meant **negotiating a middle ground** that incorporates the tested approach of Strategic Framing in a way that is adaptable and feasible for a range of staff and volunteer interpreters.

Senior staff referred to several recent and current grants that demonstrated that **NEAq has a track record of taking leadership in innovative, large scale, national initiatives**. However, in interviews \ NEAq senior staff seemed to feel that there was some confusion around the various projects that share a common vocabulary and similar objectives. NewKnowledge addressed this concern by developing instruments that contained an explanation of the *Visitor Engagement* initiative, its goals, and rationale, which was included in each element of evaluation. The statements attempted to avoid using persuasive language that might bias responses from staff.

The Visitor Experience Team

NEAq Visitor Experience staff, volunteers, and interns were given an opportunity to comment on the communications and changes in training through an online survey. In all, 64 people responded to the survey, including 12 volunteers, 6 interns, and 46 staff members. For simplicity throughout this section and based on the low number of interns and volunteers whose input could not be assessed for statistical variation from that offered by paid staff, “staff members” refers to the entire group of respondents.



Figure 4. NEAq Visitor Experience team members.

Almost all respondents described the New England Aquarium’s mission as *protecting the Blue Planet*, raising awareness, and educating visitors about how they can become ocean stewards and take action to protect and care for the ocean and environment ($n = 59$). Staff members explained that they were accomplishing this through research, education, and conservation, as well as the variety of presentations, exhibits, signage, outreach, volunteer opportunities, and programs offered through the Aquarium (see Figure 5). The consistency in results across all types of staff led us to conclude that staff are confident in their understanding and interpretation of the mission.

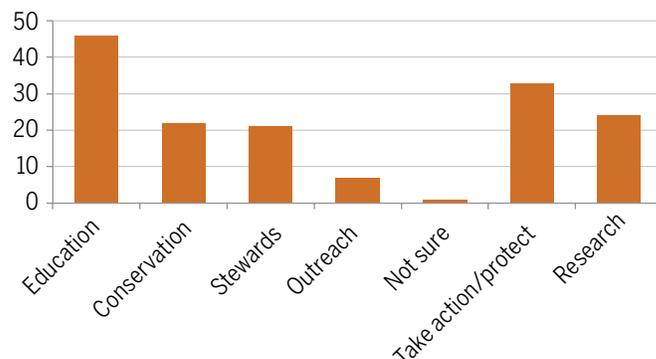


Figure 5. Frequency of topics mentioned by staff to describe NEAq’s mission.

With the exception of the newer staff ($n = 3$), all staff members reported that the mission-based communication strategies have changed in the past two years ($n = 50$). Specifically, staff members felt that there is a **much greater emphasis on protecting the ocean** and increasing awareness of ocean-related issues throughout the aquarium ($n = 27$). Many reported that this was accomplished by the implementation of a more focused framing of presentations, staff-visitor interactions, and exhibits ($n = 20$). Specifically, some staff members said that this new framework included an emphasis on conservation ($n = 14$) and on climate change ($n = 6$). Several staff members said that there has been a shift from a focus on the individual, to community action and involvement ($n = 7$). Some staff members reported incorporating the mission more in their presentations and interactions at the Aquarium ($n = 5$).

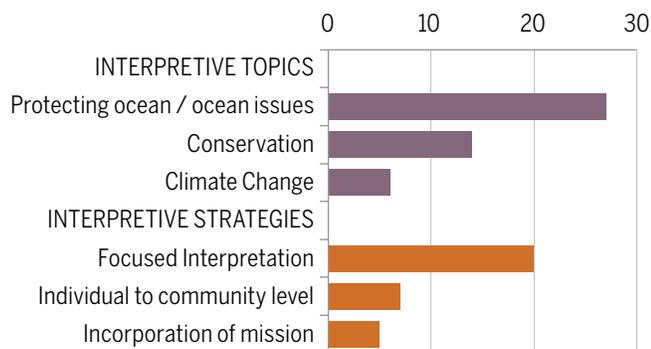


Figure 6. Increases in interpretation topics and strategies.

Note. Figure 6 distinguishes between strategies and topics, but changes as described by staff were not mutually exclusive and therefore are displayed as frequencies.

The most common lessons that staff members took away from NEAq training included the principles of how to **interact and engage with visitors** more effectively ($n = 23$) and an understanding of the techniques associated with framing their language when they talk with visitors or deliver presentations at the Aquarium ($n = 22$). Staff members reported feeling more confident in conveying messages about protecting the ocean, conservation, and climate change to visitors in the most effective way possible. These responses were relative to connecting on a personal level, using metaphors, and keeping their language positive and concise.

Other staff members benefited greatly from being able to share and learn from others throughout the training ($n = 6$). Some people shared more broadly that the training helped them focus more on the important issues surrounding the ocean and environment, rather than merely interesting animal facts ($n = 6$), and some people learned about sustainable seafood that they will both incorporate in their own lives and share with others ($n = 4$). Several staff members felt they learned the most from the E3 trainings ($n = 4$), such as how to present themselves and interact with visitors.

Staff members generally agreed that the new interpretation strategy is more inclusive of visitors because it scaffolds personal connections with visitors ($n = 28$). Staff explained that this occurs by providing visitors with ways to take action in their own homes and communities and making them part of the Aquarium's mission, rather than just receivers of the information. Many staff members also commented on how accessible the information is to visitors by

using simpler, more basic terms, and making visitors aware of how this information is part of their daily lives ($n = 21$).

To a lesser extent, staff members referred to how the new strategy caters to the audience with whom staff members are interacting by acknowledging different ages, backgrounds, and demographics ($n = 9$). Some staff members answered more generally by saying that they felt more prepared to engage visitors, rather than simply give them facts ($n = 8$). Other ways staff members found the interpretation strategy more inclusive through its use of pointing out visitors' shared values ($n = 6$), framing the information more positively ($n = 4$), pointing out how the message is now incorporated in each exhibit ($n = 3$), and that there are more staff on the floor ($n = 1$).

Conversely, staff participants felt the new interpretation strategy can be less inclusive of visitors because it may not be factoring in what visitors want to experience at the Aquarium ($n = 17$). Specifically, they believed that visitors may not want to come to the Aquarium to learn about NEAq's mission and how they can help; alternatively, they imagined that these visitors may simply be there for an enjoyable day looking at the fish and hearing about the different animals. Similarly some staff members also said that the new interpretation strategy is less inclusive of those who come to the Aquarium for entertainment purposes ($n = 6$). Other possible ways the strategy might be less inclusive consisted of its difficulty in staying positive ($n = 4$) and its accessibility, particularly to its tendency to seem overwhelming and out of reach for participants ($n = 4$). Six staff members were not sure if there were ways it was less inclusive and five did not believe anything was less inclusive.

Staff members agreed that NEAq team works to achieve ocean stewardship through the use of education about ocean issues at the Aquarium ($n = 20$). Staff members also felt that providing ways visitors can help protect and care for the ocean also works to achieve ocean stewardship ($n = 18$). For example, one staff member said they achieve ocean stewardship by *introducing visitors to the many challenges that face our oceans, giving context to why we should care about those challenges and inspiring individuals to take actions to protect our oceans, both on an individual and community-based level*.

Some staff members said that they achieved ocean stewardship simply by raising awareness among visitors about how important taking care of the ocean and the animals is ($n = 12$) or by directly engaging visitors in what they were encountering at the Aquarium so that they see their role in the NEAq's mission and in protecting the Blue Planet ($n = 11$). Some staff members mentioned how NEAq's research helps to achieve ocean stewardship ($n = 10$).



Figure 7. Visitors attending a Giant Ocean Tank presentation.

When asked how staff members believed the new signage might have helped visitors, participants responded that the **signage provides visitors with information on ocean issues, conservation, climate change, and the Blue Planet** at every exhibit, which is information they may not receive just by looking at the animals ($n = 17$). Many participants also commented on the new design of the signs and how the bright colors, new technology, interactivity, and clear information are much more effective for visitors ($n = 17$). Thirteen staff members said that they felt the signs were much more informative than they were before and eleven said they felt the signs are more engaging and connect visitors to what they are seeing and reading.

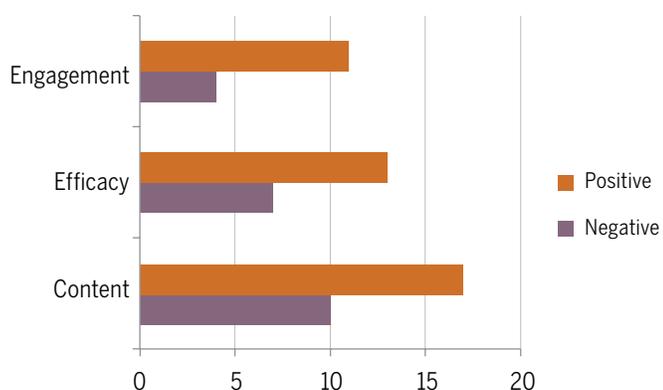


Figure 8. Positive and negative feedback from staff about new signage.

Note. Positive and negative feedback was not mutually exclusive. Items are displayed as frequencies.

Some negative notes that emerged in the findings included some staff members being concerned that the new signage had too many words and not enough graphic support, leading to a perception that visitors disregard the signs ($n = 10$). Staff members claimed that visitors tend to not read signs in general when coming to the Aquarium and exhibits ($n = 7$). Some staff felt the new signs are difficult to find, often in dark, unlit places or are too small for anyone to see or read ($n = 5$). Others felt that the signs did not always connect to the exhibits, misleading visitors into expecting exhibits or animals that were not on display ($n = 4$). Other possible limitations with the signage included:

- Not stating rules of the Aquarium clearly, such as no flash photography or gum chewing;
- Not building excitement among the visitors;
- Not referring visitors to other resources to find more information or things they can do;
- Outdated or unclear signage, such as the fish ID cards; and
- Not providing a selection of languages, lack of interactivity, including technical problems with the interactive displays.

Visitor Experiences survey participants who had been at NEAq for more than two years were asked to think about their skills and knowledge about five topics with which they engage with visitors on a daily basis. These topics included ocean issues, directions around the facility, conservation actions, climate change, and animals in touch tanks. Figure 9 indicates how staff members rated their preparedness regarding the five topic areas before and after training, where a 1.0 score represented *Not at all Prepared* and a 5.0 meant *Extremely Prepared*.

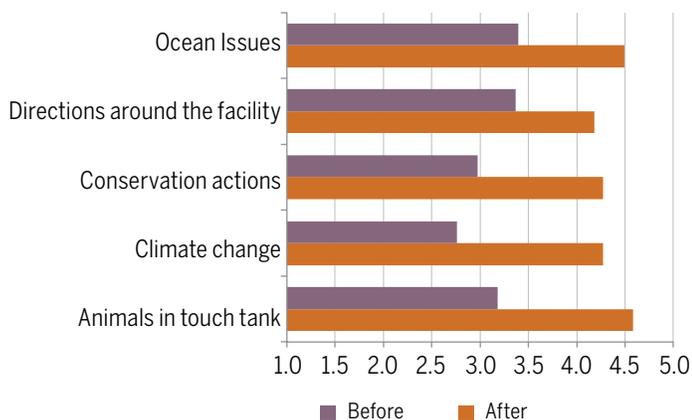


Figure 9. Self-assessed skills and knowledge before and after IMLS-supported training.

Overall, staff feel significantly more prepared after the IMLS trainings in each of the five areas ($M = 4.46$, $SD = .50$) than prior to the trainings ($M = 3.14$, $SD = .85$); $t(37) = -9.98$, $p < .001$.

Recommendations

Continued training and development of support resources for the Visitor Experience staff will encourage a sustained level of knowledge, confidence, and skill development for interaction with visitors, an integral part of positive visitor experiences.

We note that about a third of the staff believe that visitors may only be interested in the entertainment aspect of their visit and believe that mission-based interpretative strategies that focus on societal issues such as climate change may be too serious or negative a topic to talk about. Here we note that there appears to be a perception that learning experiences are not perceived as entertaining. It may be useful to **reiterate for staff that learning new things and synthesizing prior information into something useful is perceived by most people to be entertaining**. This is considered “puzzling” through a problem. The challenge may not be disinterest in learning, but rather a disconnect between the type of content the interpreter seeks to deliver and the challenge the visitor finds within their grasp or world experience. We recommend that **additional resources in the training tools be developed to focus on why learning is fun**. Offering staff information about Vigotsky’s *Zone of Proximal Development* may help them understand how to set a benchmark for learning that is appropriate to a learner during an interaction. Often, lack of perceived usefulness of content by a visitor may be assumed to be visitor disinterest. More commonly, this is a problem of a lack of

fit between the learning that is entertaining for the visitor and the content the interpreter hopes to deliver. This may require more internal conversation to find the right balance between how to negotiate what content a visitor finds appropriate. **Modeling by senior staff and a few leading interpreters may help staff develop conversational skills to fit content to visitor interest.**

NewKnowledge also believes that the training program and resources that Visitor Experience staff is exposed to are still fairly new (see observation studies later in this report). We feel that there is an internal sense of confidence among staff about the objectives of framing and the mission, but lack of comfort using techniques like a “pivot” or strategic questioning to develop an understanding of a visitor’s knowledge comfort and inquiry level. **These are all high-level interpretive skills that require practice and may be outside the comfort zone of some interpreters.** We are not suggesting that the responses to the survey are inaccurate, but rather, that staff knowledge of the objectives and goals may not match observed behavior, in part, because the team is still working to develop these skills. We recommend **continued staff support and discussions** about how to best tackle challenges with presenting this information to help front line interpreters operationalize the theory that they seem to understand and can explain to evaluators.

Some staff comments expressed interest in helping visitors internalize the responsibility for action rather than assuming ocean conservation is “beyond them” – this is challenging. We suggest that **invoking social norms or “club” type language that introduces visitors not to individual behaviors, but “common behaviors for those who like us who share our concerns”** helps to build this capacity. While staff may understand the principles of Strategic Framing, more practice in situating solutions in social groups may help increase confidence and likelihood of retention.

With regard to the staff comments on signage, we tend to agree with their observation that the text is somewhat complex given the size of many spaces. While we cannot comment on animal identification labels currency with regard to the collection or internal process, we would suggest that a **focus on “infographic” type signage** that attempts to simplify constructs or ideas to support quick scan reading of content may increase likelihood of viewing. We also note, however, that studies in zoos and aquariums have revealed that frequent visitors often know the signage content and may not read it but know what’s there. First time visitors tend to do a quick scan because the scale can be overwhelming. Therefore, it is not uncommon to see people walking by signs and to assume they are

not reading them when. In fact, they are already somewhat aware of the content. **Helping staff understand the support role for signage may alleviate some internal concerns.**

Similarly, we would not recommend more signs to address behavioral issues like preventing flash photography or gum chewing. While these are commonly cited complaints among front-line staff in museums, we recommend that **helping interpreters understand that following “codes of behavior” are ideal openings for conversation** and engagement, and should not be treated as the responsibility of signs.

The staff also noted that signs do not direct people to other resources to go further in their investigation. Again, we note that signs in aquariums or zoos that direct visitors to follow-up websites tend to have limited success because the distance between reading and acting are substantial. Follow-up opportunities on maps or other take-home materials are likely to be more successful as reminders. We recommend developing **materials to guide staff through the principles of what signage can achieve** *when leveraged by personal connections and discussions with interpreters* as the key for linking people to follow-up content. We also believe that experimentation on what can be done with signage that elicits follow-up may be valuable as a new area for innovative study.

The one staff comment worth addressing is the lack of multi-lingual signs. As noted later in this report, the intercept surveys revealed a surprising number of unilingual Francophone and Hispanic visitors as part of the general exit population. Creating a small amount of signage or possibly iPad or Smartphone translated signage or tour support might help the institution to increase engagement for those audiences. Identifying staff with language skills to support those audiences, possibly with designated flags on nametags or noting this accommodation at entrance if or when it is implemented will all demonstrate an interest in engaging with the entire visiting audience.

OBSERVATIONS

Overview

The project team observed visitors and staff (including volunteers and interns) engaging with each other through informal interactions and formal presentations at the Aquarium. These observations served to inform the research team of the methods and techniques used by interpreters to engage Aquarium visitors. In addition, the observations provided contextual data that instructed the NewKnowledge assessment of the visitor experience.



Figure 10. A staff member led a formal presentation in the penguin exhibit.

Methods

NewKnowledge researchers observed informal interactions between staff and visitors in addition to observing formal presentations. Informal interactions were classified as non-presentation discussions, such as one-on-one chats, indirect interpretation such as a visitor asking a staff member a question, and other direct discussions between visitors and volunteers or

staff members. The informal interactions lasted from 15 seconds to five minutes, whereas the large formal presentations often lasted 10 to 20 minutes.

The observation instruments used for both the informal interactions and the formal presentations assessed visitor demographics, the content of the conversation or presentation, and the level of visitor engagement.

Results

The average observed length of informal interactions between visitors and staff at the Edge and the SRTT was 3:56 minutes, whereas the average length of the presentations observed was 15:18. At large presentations such as at the GOT and the Penguin exhibit, visitors often arrived on time for the start of the talk but then moved to another exhibit after about five minutes. This might be due to limited attention span, group agendas for the visit, and several building factors that may influence visitors, including:

- **Foot traffic** around the spaces tended to give the sense that standing still obstructs others;
- **Overhead speaker placement** gave visitors a sense they might hear or see better if they move around;
- A very live **acoustic environment**, especially at the GOT and Penguin presentation areas (the reverberation off the concrete, especially for lower frequency sounds including mechanical equipment, lower toned voices); and
- **Proximity to other exhibits** that are visually appealing.

The NewKnowledge team also observed that for the GOT and Penguin presentations, many visitors stopped for about five minutes rather than attending the entire presentation. This was particularly evident when crowds were larger. Based on this limited exposure to the presenter, we suspected that most visitors do not hear the *Live Blue* messaging, which tended to be discussed at the end of a presentation. For those who arrived late, if they heard the *Live Blue* message, they did not hear the pivotal setup that linked the exhibits and habitats to principles of sustainable living.

Just as visitors might not have heard the *Live Blue* messaging because they did not remain at the presentation long enough, visitors were also not making it through to the Q & A part of presentations.

Recommendations

Formal presentations should to be restructured to accommodate short attention spans and issues of overcrowding and acoustics.

To overcome the environmental challenges of reverberation and noise that often characterize the GOT and the Penguin exhibit areas, presenters can work to **modulate their voices and timing**. Specifically, higher timber voices with more modulation, pauses in speech, and more inflection on key points are more easily heard. One NewKnowledge observer noted that *men's voices were more likely to be muffled and masked by background sound, with key words and phrases lost during the presentation. The women presenters observed were more likely to modulate their voice and were easier to hear.* Voice coaching from professional actors may help presenters and educators become more skilled at using their voices as instruments, becoming more engaging and enthusiastic.

To compensate for the *passing-through* visitor's attention to the message, the GOT and Penguin presentations might be **restructured to ensure the core conservation message is delivered at least once every five minutes** and that the message be buttressed with a comment about *what you can see before you*. This structure does not need to be a repeated phrase, but might be different ways of saying the same thing, possibly mentioning a **reminder or recap of concept and purpose** for the talk to ensure the message is delivered.

Restructuring the presentations (based on the frames shown in Figure 11) to behave like three or four short related segments of references to the exhibit then mission-based messaging will likely increase likelihood that key content will reach its intended audience.

The Theater of Interpretation

Addressing challenges and implementing changes in interpretive skills and presentation may include the following:

- Voice Coaching
 - Increased Vocal Modulation
 - Exaggerated Timing and Pauses to Underscore
 - Practice Using the Room as an Instrument
- Restructuring Presentations
 - Buttressing claims with obvious links
 - Restated conservation messages
 - Recap core concepts frequently

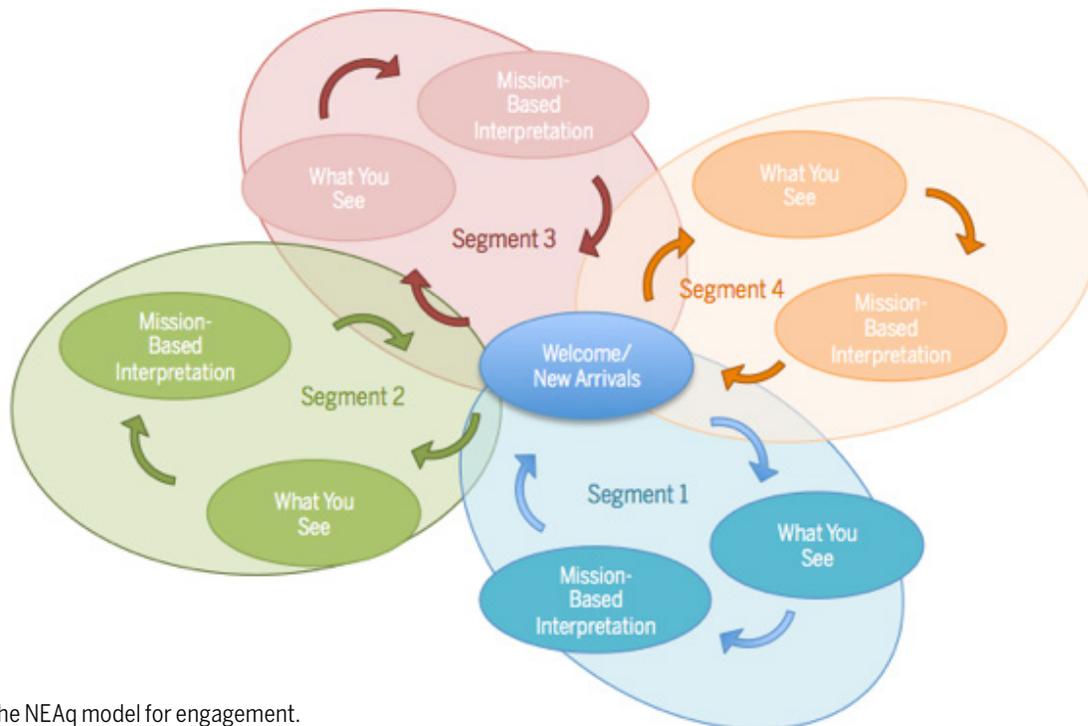


Figure 11. The NEAq model for engagement.

VISITOR ENGAGEMENT

Overview

The NewKnowledge team conducted a series of qualitative and quantitative post-interaction intercept surveys, post-presentation intercept surveys, exit intercept interviews, and four focus groups in June and July of 2014 at NEAq. These activities were used to determine the degree to which visitors interacted with interpretive team members, how NEAq's mission-based messages were communicated to visitors, and how visitors were responding to information they received from their engagement with the interpreters.

Methods

During observations of informal interactions, a NewKnowledge researcher intercepted visitors whose interactions with the Aquarium staff lasted for more than 15 seconds, asking them to complete a follow-up survey. Visitors' perceptions of interactions over 15 seconds provided data on topical interactions that included but were not limited to conservation, animals, oceans, etc. This enabled NewKnowledge researchers to interview visitors who had had meaningful and telling interactions with NEAq staff rather than questions about visitor services (i.e. directions to exhibits).

These survey instruments assessed visitor engagement characteristics such as demographics, the content of the conversation or presentation, and retention of information from the visitor-staff interaction.

As a method to supplement information obtained from the Visitor Engagement surveys, NewKnowledge held four focus groups at the New England Aquarium. The focus group questions were designed to address the values in the mission statement as a method of assessing how recent changes in interpreter communication skills and techniques impact visitors' understanding of and engagement with the Aquarium's mission and goals.

Participants

Thirty-nine visitors were asked to participate in a survey following their interactions with staff and volunteers in the exhibit galleries, including the Shark and Ray Touch Tank and the Edge of the Sea Tidepool. Out of these, 28 visitors accepted and completed the survey. Nine groups of visitors indicated this was their first time at NEAq, another seven said they had visited previously in the past two years, and five respondents said they were members of NEAq.

Results

Overall the majority of visitors felt they learned new information from the presentations and informal staff interactions. Visitors commented that staff (including volunteers and interns) were friendly, engaging, and knowledgeable. Most visitors recalled learning new animal facts, while only a few could describe NEAq's Live Blue mission. The major complaint voiced by visitors was overcrowding.

Each focus group included two to eight participants, primarily longtime NEAq members, as it was more difficult to incentivize short-term visitors to Boston or those traveling with young children.

Post-Informal Engagement Intercepts

Visitors reported that their interactions with staff had to do with the **animals in the exhibit or the touch tanks** ($n = 19$). Many visitor groups indicated learning something new ($n = 15$) and this information was generally about the animals they were seeing or touching, which all visitors believed to be accurate information and delivered confidently. When asked about their favorite parts of these interactions, the most frequent responses were touching the animals ($n = 7$) and the information provided by the interpreter ($n = 7$). Seven of the intercepted visitor groups also felt that **staff members were very friendly and engaging**, making visitors feel welcome, and giving both adults and children answers they could understand.



Figure 12. A small group session at the Blue Planet Action Center.

Post-Presentation Intercept Surveys

Twenty-eight visitor groups participated in interviews after hearing and seeing presentations at the Giant Ocean Tank (GOT), the Penguin exhibit, and at the Blue Planet Action Center (BPAC). Fifteen visitor groups reported learning about marine animals from the presentations they saw. Six GOT visitor groups said they learned about the inner workings of the Aquarium. Topics such as sustainable fisheries, chemical changes in the ocean, and conservation topics were mentioned after the smaller presentations at the BPAC.

When asked about their favorite part of the presentation experience, 10 visitor groups commented on the **quality of the presentation and the information shared**.

When these visitors were asked about the greatest challenges that face the ocean today, 15 visitor groups indicated they believed *pollution* was the biggest challenge. Three of those groups specifically mentioned *oil* and *trash*. Half of the visitors mentioned more than one challenge, included but not limited to *global warming* ($n=4$), *overfishing* ($n=4$), and *humans* ($n=4$); only two visitors said they were *not sure*.

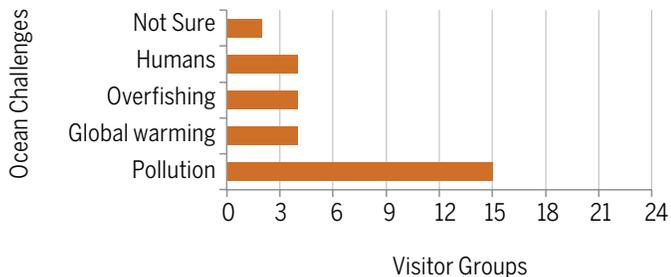


Figure 13. Different challenges visitor groups believe the oceans face.

One NewKnowledge researcher intercepted a couple from the Netherlands leaving the Aquarium who said that they were very impressed by the Aquarium and its commitment to conservation, but that was a surprise only because they felt Americans in general were less supportive of conservation efforts than Europeans.

NewKnowledge team members asked visitors who saw presentations *what [they] might be able to do to help reduce challenges that face the oceans*. Of 22 responding visitor groups, they offered 11 different solutions or ways to help mitigate the challenges that oceans face. Visitors most frequently shared that not polluting is important ($n=8$). Seven visitor groups believed that education and awareness

would mitigate ocean challenges, and four groups suggested recycling.

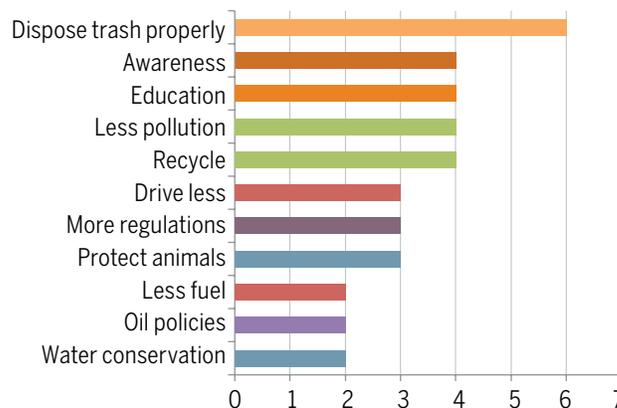


Figure 14. Responses to reducing ocean challenges.

Note. Color coding scheme is meant to convey the similarity of solutions indicated.

Interestingly, many visitor responses implied a belief that caring for the ocean is the responsibility of others, suggesting that messages conveyed by interpreters were not internalized by visitors. Only five visitor groups answered the question as if caring for the ocean was something they themselves could and would do. Three groups answered partially for themselves and partially for what other people can do, for instance: *Conserve if you can. Be conscious about the effect we have.*

Exit Intercept Survey

Sixty-percent of visitors noted that they had **interactions** with staff or volunteers during their visit, **almost double the rate reported in summer of 2013** (Morey Group, 2013). Consistent with the post-presentation and post-interaction intercept results, the visitors interviewed while leaving the Aquarium learned new information about the animals at the Aquarium. Of 63 visitors who participated in exit intercepts, only seven visitor groups said they were not sure if they learned anything new or had not learned anything new. Nine people reported learning interesting things about the aquarium itself.

Just over a third of the visitors reported that the GOT or GOT's star attraction—Myrtle the green sea turtle—was the most entertaining part of their visit ($n=22$). Almost a quarter of visitors said that the Shark and Ray Touch Tank was the most entertaining part ($n=15$).

Many visitors intercepted at the end of their visit reported more than one aspect as the most entertaining part ($M = 1.51$, $SD = .79$), expressing clear appreciation for a variety of exhibits and attractions.

Similar to the post-presentation intercept data, visitors reported pollution as the major issue facing our oceans. Almost 30% ($n = 18$) reported overfishing as another major issue.

Visitors leaving the Aquarium were asked *what was [their] least favorite part* about their visit. The most frequent response was the crowds ($n = 16$). Waiting in the ticket line was also mentioned ($n = 7$), but many visitors expressed overall satisfaction and claimed not have a least favorite part ($n = 13$).

Data from the intercept interviews suggested that visitors were interacting with Visitor Experience staff with more frequency, but that mission-based interpretation was not yet reaching visitors effectively. NewKnowledge was not sure if this is because of pre-existing notions by visitors about ocean issues and how to help the ocean, or if mission-based strategies are not being fully employed by Visitor Experience staff. Given that visitors reported learning from staff and volunteers, that their interactions were positive, and that some visitors did respond to interview questions with presented information, NewKnowledge believed that most of the discrepancy between answers and the mission-based interpretation was due to pre-existing norms held by the public concerning ocean problems and solutions that need to be challenged.



Figure 15. Staff engaging with visitors.

Focus Groups

The discussion groups were primarily comprised of NEAq members, who generally had positive feedback regarding Aquarium staff, renovations, presentations, and the new signage. While the focus groups yielded clear affection for NEAq, members were also better

able to comment on the changes that have been occurring over time, offering a critical and informed opinion that was invaluable to this evaluation.

Focus group participants described NEAq staff as **professional, approachable, and available** when they have questions during visits. Most were quite supportive of how the Aquarium staff initiates conversations, finding them very knowledgeable and informative. A few mentioned that staff were skilled at targeting their responses to suit the age of the listener, both in terms of delivery and content. Members believed that having young staff, interns, and volunteers, may help draw in more young visitors.

Although the discussions surfaced positive comments about the staff, members still felt the need for more staff availability during high traffic times, as exhibitions and activities cannot replace having a live person available for spontaneous interaction. Similarly they found that technical issues or being unable to find specific information was a hindrance during some visits.

When asked to compare NEAq to other aquariums, the discussants felt that NEAq focuses more on education than entertainment. They felt that efforts to incorporate more entertainment might challenge the educational aspects that are believed to be integral to NEAq brand. We note here that entertainment, when considered in the context of these discussions was often characterized as shallow or distraction-based rather than the positive psychology interpretation as enjoyable pursuit or the experience of flow. One participant, in particular, felt that the Boston/Cambridge area was typified as a uniquely academic culture in the US and that cultural institutions are held to a higher standard than they might be in other areas of the country. That latter respondent, a professor at a well-known major college in the area, felt that this expectation for more adult-level interpretation and mature content matter was a source of pride that encouraged families like his to visit the Aquarium frequently.

Members were more likely to comment on mission-based communications they received through their membership materials, such as the email newsletters and magazines. They felt this material told a more complete story about the Aquarium's activities, that one would never find out from a one-day visit. Interestingly, in a few of the discussion groups, these members often described their role in sharing the information with visitors when they visited, striking up conversations with non-members to explain what NEAq is doing behind the scenes as a conservation organization.

Many of the members were able to recall specific content they learned through the Aquarium, but some offered specific instances of when and where they came to know this information. They described

their learning as a gradual increase in understanding, a *gestalt* that linked casual reading before and after their visits with experiences at NEAq. When pushed, most described special event programming such as a behind-the-scenes tour or personal experience that were more memorable than a specific visit.

Participants were uniformly positive about the new signage because of its age appropriateness, level of detail, and how these news signs relate to the Aquarium's overall story. One member felt that each sign should relate to an aspect of the Aquarium's mission so the call to action would be more obvious to casual visitors, who – that member felt – were not as committed to the mission as members. Other members were less satisfied with specific animal identification signs, or lack thereof, that were difficult to match to some fish. However, a few members could not recall any specific changes to signs noting simply that they were nice and new.

When considering the facility, many members were pleased with the upgrades but lamented that more radical renovations and expansion cannot happen. They felt the atmosphere of the Aquarium was pleasant and helped guide visitors through the facility. Most, however, noted that the Aquarium is a victim of its own success, with over-crowding and sold-out member nights reducing the quality of the experience.

The members claimed that they are able to learn about NEAq's missions from the exhibits. They suggested that they have learned small ways everyone can help. This was not a consistent response and led to disagreement among attendees with some feeling it was very obvious and others feeling the mission was subtler. In general, these findings suggest that the upgrades to signage and messaging in print communications are reinforcing the mission for members, but could increase the calls to action beyond current levels. These members described themselves as very supportive of the Aquarium's mission, and might benefit from hearing more about how NEAq need is working to engage more audiences.

One of the disappointments that many of the participants shared was the loss of the observation into the veterinary facility. They felt being able to see veterinary work helped visitors feel more engaged and connected to the Aquarium and its mission. They did not feel that the current signage or communications filled that core meta-story about care and help. This loss somehow seemed tied to the desire these participants expressed for a more concrete local focus on environmental action. While they appreciate the broad focus of NEAq's efforts, as Bostonians, they felt that more could be done to engage them as activists focused on water issues nearby, including the harbor and fisheries.

Recommendations

Based on data collected during visitor intercepts and focus groups, NewKnowledge recommends that efforts be made.

- For informal interactions, **develop strategies that help interpreters situate the recommended solutions in words and concepts that the visitors offer;**
- Because many visitors felt they are already doing what they can, it may be helpful to **develop a broader range of tangible solutions** to big problems that may more closely support visitors' thinking about how to extend their existing conservation practice with a higher activity target;
- Take advantage of new opportunities to engage with members and non-members through campaign-based action. Strategies may include member communications that **explain messaging strategies, offer models** of what some members have done to promote the mission, and **encourage members to see themselves as the voice of action** to Live Blue;
- It was apparent that some visitors use library memberships or look to cultural organizations in the community as their primary affiliation. **Creating communications tools that accompany borrowed memberships and passes at the library**, or possible orientation tools can help to extend the message or pre-arm visitors with mission-based ideas. Examples might include: *Most people who use this shared membership are also committed to eating only sustainable fish, or also use public transit and are part of the solution to reducing Boston's carbon footprint. We consider you, the borrower, as part of the NEAq commitment to a better Blue Planet. By sharing our mission with your friends and family, you are part of our NEAq family.* We do not recommend misrepresentation, but we are confident based on feedback that this effort includes two community solutions. Specifically, this suggests that instead of being something that is perceived as economic constraint, the user is doing something honorable and valued; and
- Use member communications media to re-broadcast pre-visit mission-based messaging to **help members frame their guests and other visitors' experiences before a visit.** Again, examples include invoking social norms and offering modeling information.

TOOLKIT REVIEW

Overview

The Interpretive Toolkit was designed as an evolving collection of tools and resources for interpretive staff and volunteers. The Toolkit serves as an intermediate training tool for interpreters that have a basic knowledge of interpretation but are not yet ready to lead framed presentations for large audiences. In the past, *Strategic Framing* has been introduced only when interpreters are preparing and training to conduct large formal presentations.

The Toolkit introduces Strategic Framing much earlier in the training process, and in a format that is better suited to assist less-experienced interpreters. It includes resources to support communication opportunities within the context of mission-based interpretive strategies, covering a range of ocean issues, values, and talking points, including Strategic Framing solutions.



Figure 16. Staff member with jellies in a tube.

Methods

The Toolkit review instrument was developed based on goals established in the grant narrative, through collaboration between NewKnowledge researchers and NEAq Visitor Experience staff. The instrument was designed to assess the following:

- Identification of the *Resources*, *Ocean Issues*, and *Values* included in the Toolkit;
- Alignment and clarity of the *Resources*, *Ocean Issues*, and *Values* to the Strategic Framing talking points (i.e. theme, causal chain, metaphor, and solution); and
- Sustainability and adaptability of the Toolkit based on the availability to use varying Resources to discuss Ocean Issues in light of four American Values (i.e. Innovation, Interconnectedness, Responsible Management, and Stewardship).

Alignment of the *Resources*, *Ocean Issues*, and *Values* to the Strategic Framing talking points measured on a scale that included the following options: *Clearly Aligned*, *Mostly Aligned*, *Somewhat Aligned*, *Not Aligned*, or *Not Applicable*. These five ratings were then converted to numerical values of 3, 2, 1, 0, and N/A, respectively. A NewKnowledge researcher used a rubric to grade the alignment of the *Resource*, *Ocean Issue*, and *Value* to the four talking points, the *Theme*, *Causal Chain*, *Metaphor*, and *Solution*. A second NewKnowledge researcher used the rubric with a random sample of exhibits and then the first researcher compared scoring.

Results

A thorough review of the Interpretive Toolkit conducted by NewKnowledge researchers revealed that there were 28 Strategic Framing pages to go with the general description of 31 exhibits. Some exhibit areas like the Penguin exhibit and the Giant Ocean Tank had multiple Strategic Framing pages. However, eight exhibits did not have Strategic Framing pages.

One of the barriers to understanding the Toolkit was that the **values were not clearly defined** in the beginning of the document, such as the definition of *Interconnectedness*, and the difference between *Stewardship* and *Responsible Management*. These values were not presented on equal footing, where a focus on *Innovation* occurred only three times, but *Interconnectedness* and *Stewardship* were the focus of nine and 10 Strategically Framed interpretations, respectively.

The five *Ocean Issues* presented in these framed discussions were also unevenly distributed. *Overfishing* ($n = 11$) and *Climate Change* ($n = 10$) dominated as the main *Ocean Issues*, whereas

Ocean Acidification was only noted once. Some of the Strategically Framed talking points could have focused on *Ocean Acidification* as opposed to *Climate Change*, for example at the Cuttlefish exhibit in the Tropical Gallery. *Pollution* was the focus for only three Strategically Framed talks, but visitors most frequently reported that pollution was a major ocean issue. In assessing this portion of the toolkit, it is important to note that even distribution of content is not necessarily a requirement for even messaging, but it is likely that if visitors hear a message only once or twice, they are less likely to recall that message. If the goal is to ensure commitment to action, then it may be necessary to consider how to develop at least three locations for each main issue if retention is desired. If the aim is a gestalt about conservation, then single mentions may be sufficient. However, we note that a gestalt may communicate a mission but will not necessarily be deep enough to engage a visitor in a behavior.

After coding the toolkit, the team found that inter-rater reliability was calculated to be 64%, which is not considered reliable. The low agreement on the clarity of the Toolkit messaging corroborates the findings that the messages outlined in the toolkit would not necessarily result in visitors receiving the intended messages. Both researchers agreed that the *Resources'* connections to the talking points other than the *Theme* could be strengthened. For example, in the Tropical Gallery at the Sea of Cortez exhibit, the *Resource* recommended is a Mako shark jaw, but it is unclear why Mako sharks are declining from overfishing. The researchers wondered if it is because they are killed as bycatch, overfished, or are they threatened by another issue?

After an internal discussion to account for the low inter-rater reliability, both researchers agreed that *Metaphors* were difficult to score and could be made more direct and apparent. A spaghetti strainer was suggested as a *Metaphor* to explain *Pollution* and how chemicals enter waterways at the Pacific Northwest Exhibit in the Northern Waters Gallery. One NewKnowledge researcher suggested using a coffee filter metaphor instead: *Even though the big granules do not get into the coffee cup, the water that goes through the granules and the filter becomes coffee.* For example, the heat-trapping blanket may be conceptually clear but converting it to a simile by saying *CO₂ acts like a heat trapping blanket* and then use the metaphor again to say wrapping the planet.

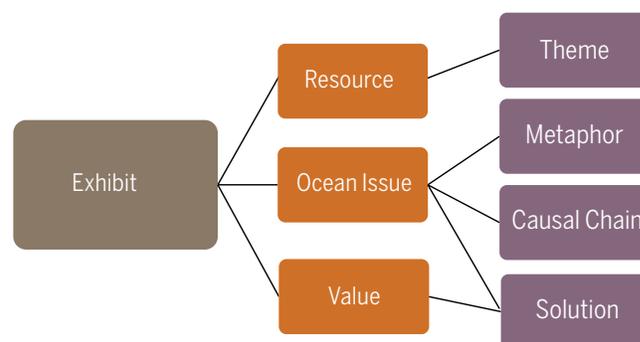
Throughout the Toolkit, fishing is described as increasingly efficient but it is also noted that fewer fish are being caught. The way that overfishing, fishing efficiency, and fewer catch are described seems to send conflicting messages to those who are not familiar with the fisheries industry. Describing the fisheries as *industrial scale*

harvesting, may explain the apparent contradiction in the simplified model and make the outcomes more clear.

Solutions were generally aligned with the *Ocean Issue* and the *Value*, but NewKnowledge researchers found the *Solutions* very broad or complex enough that visitors would need to make a number of inferences to follow the logic. Figure 17 demonstrates how strongly the ideas (*Values* and *Issues*) and objects (*Resources*) as described in the Toolkit relate to the exhibit and the Strategic Framing talking points.

We conclude that the Toolkit undertaken through this IMLS funding is a massive effort to detail themes to messages by following a Strategic Framing rubric. The effort has clearly paid off in overall staff knowledge of the conceptual model for Strategic Framing and their ability to link an action to a talking point. This review suggests that the next phase of development might benefit from challenging assumptions and how a visitor might follow the conceptual logic. Attempts to simplify statements, steps in an argument, may make the solutions easier to grasp, especially if the solutions are found in progress that small groups can accomplish together.

Figure 17. Strongest correlations present in the Toolkit.



Recommendations

NewKnowledge recommends continuing to modify the Toolkit, with particular attention to be paid in the following efforts.

- **Develop a more expanded definition of each of the four values** and offer an example or two of those four values, *Innovation*, *Interconnectedness*, *Responsible Management*, and *Stewardship*, in relationship to the mission. This expanded definition will offer the developers an overall guide to reading the toolkit or thinking about their own solutions in line with the primary models;

- We recommend an effort to **expand the distribution of interpretation about the different Ocean Issues more evenly around exhibits** or to concentrate two or three messages in a single area to help establish continuity for the visitor. Organizing sections of the Aquarium to reinforce an issue may reduce the risk of dilution or sense of overwhelming problems that can result in visitors either distancing themselves from the solution or attributing all the messaging to a vague *gestalt* that does not involve them as social actors;
- We recommend additional **focus on strengthening the alignment between the Resources and the associated talking-points**. We believe that more direct relationships will make it easier for visitors to follow the interpreters line of thinking and, more likely, help them to bridge their current behavior to a future action; and
- Based on feedback from the staff survey, the observations of interpreters in action, and the toolkit, it seems that the theory is clearly in place, but there remain challenges understanding the structure of a *Metaphor* in interpretation. We suggest that by **using a simile or analogy, providing specific Solutions that visitors can do to Live Blue, and anchoring the behaviors in a small social setting, we can help interpreters offer more clarity in their presentations**. Based on this strategy, we believe interpreters can become more conversant in the use of metaphoric language and language structure to achieve the conservation goals set by the mission.

Schwartz (2010) discusses six core natures of values. While a value alone will not motivate behavior, multiple values can heighten connections to behavior. Covering values and issues more equally can help set the stage for invoking social norms. These social norms will in turn help engage visitors in civic action, but these need to be anchored to the social community where visitors invest their time and energy, such as a religious house, a workplace, or neighborhood group.

It may benefit the organization to **create a short introduction to the Toolkit that outlines social norms theory**. We feel explaining how we depend on one another for emotional support, how people respond to affirmations of their own existing actions as a source of satisfaction, and how people seek to be part of successful groups, are all important in conservation messaging.

Providing specific asks that visitors can do at the Aquarium or at home can help ground very broad asks. **Identifying key organizational partners or community groups that are aligned to the mission may be helpful to visitors**. Similarly, providing a place where visitors can sign up for renewable energy to be used towards their electricity may be a helpful option. *Solutions* can invoke a social norm for a small community that shares concerns, such as a church group, business group, or neighbors.



Figure 18. Visitor experiences team member at the Edge with visitors.

Discussion and Recommendations

KEY ACCOMPLISHMENTS

The New England Aquarium has undertaken a **comprehensive approach to engaging visitors with its mission**, including the training of staff and volunteers in effective interpretation techniques; implementing an ongoing visitor engagement training plan for front-line staff who play an equally important role in ensuring positive experiences for visitors; and developing new resources to ensure that interpreters are continually well-informed about links between the Aquarium's mission and exhibits.

This summative evaluation suggests that recent transformations to NEAq's exhibits and communications have been successful and resulted in **high levels of visitor satisfaction and education**. Data indicates that strategies are being implemented to convey NEAq's mission of protecting the oceans to a broad audience, and that this message will be conveyed even more effectively as staff undergo continued training using the new Toolkit and continuing to adapt this tool to changing audiences.

Even as overcrowding on the exhibit floors continues to be an issue that affects visitors' comfort, **NEAq has the capacity to serve growing audiences** in a way that meets and often exceeds expectations. This study found that crowding did not prevent the desired learning outcomes, interactions with on-the-floor interpreters were noted by most visitors even when the building was crowded, and most visitors seemed to enjoy their experience in the Aquarium.

Overall, interactions with staff and volunteers increased from summer 2013 when 31% of visitors reporting interacting with staff and volunteers, to almost 60% in summer 2014. Visitors consistently indicated feeling welcome and commented that **staff members and volunteers are friendly, engaging, and knowledgeable**. Interpreters were seen as reliable sources of information offering quality presentations. Most visitors reported learning something new about the animals at the Aquarium, often in the touch tanks.

Support of NEAq administrative leadership facilitated the success of the project and will be critical for implementing the recommendations of this summative evaluation. Visitor Experience staff members demonstrated a **high degree of awareness about the mission**. Staff at all levels felt that there is a much greater emphasis on protecting the ocean and increasing awareness of ocean-related issues throughout the Aquarium, and that they have learned how to interact and engage with visitors more effectively. Staff members reported feeling more confident in being able to effectively convey

messages about protecting the ocean, conservation, and climate change. Staff members were generally in agreement that the new interpretation strategy is more inclusive of visitors because of its emphasis on making personal connections and a desire to focus on solution-oriented actions rather than treat visitors as passive recipients of information.

Among Aquarium members there was widespread awareness of and support for NEAq's mission, but most visitors still reported learning information about animals, which did not necessarily connect to the bigger picture. Awareness of NEAq's mission and training staff in mission-based communication is fundamental if Aquarium visitors are to engage in protecting the Blue Planet. **Strategic Framing efforts and the alignment of communication with NEAq's mission are showing promise** and should be re-evaluated when the revised Toolkit has been consistently used to train interpretive staff.

CHALLENGES

Overcrowding was an issue mentioned by NEAq visitors and one of which there is limited ability to address. The summer season—when data was collected for this summative evaluation—tended to be particularly crowded. This atmosphere at the Aquarium might have diminished visitors' ability to embrace complex messaging. For those attending a live presentation, foot traffic around the spaces may indicate that standing still obstructs others and overhead speaker placement gives visitors a sense they might hear or see better if they move around.

The **sound acoustics** of the GOT and Penguin presentation areas compromised audio quality, where there was a high degree of reverberation off the concrete, especially for low frequency sounds including mechanical equipment, and low-toned voices.

Anytime mission-based communication was occurring, the integrity of the message was threatened by **short attention spans, proximity to other exhibits** that offer rich visual attraction, and the tendency for people to revert back to **prior mental models** that have already taken hold (e.g., pollution is the biggest threat to the oceans, we need to recycle more) rather than truly embracing the mission-based messaging.

RECOMMENDATIONS

NewKnowledge encourages NEAq to consider implementing the following recommendations.

- To help redress challenges with overcrowding, front-line and interpretive staff should redouble efforts to:
 - **Reinforce** internal successes where NEAq team members proactively engage visitors in a friendly and informed manner;
 - **Find more flexible strategies** for leveraging the number of interpreters making quick positive contact with visitors during high traffic times;
 - **Increase mentoring** and support staff practice with one-on-one or small group conversations that incorporate language aligned with NEAq's mission to help build facility and comfort with the vocabulary and goals; and
 - **Help staff to identify positive tone** and use of social norms in conversation to help orient conversation toward post-visit action consistent with what visitors who support the mission do.

To compensate for short attention spans and better capture those visitors who move around instead of staying in one place, the large format presentations could:

- **Be re-engineered to deliver core content in 3 minute "chunks"**, each linking to an aspect of the core conservation message;
- **Use cyclical messaging** to anchor messaging to the exhibit every 90 seconds rather than relying on following the storyline; and
- **Reinforce core concepts during the Q&A sessions** in small group settings rather than facilitated by the main presenter.

To overcome the environmental challenges of reverberation and noise that characterize the GOT and the Penguin exhibit area, presenters can:

- **Slow their speech**, modulate their voices and use strategic pauses before and after important points are made;
- **Use repetition** to reinforce a core concept or phrase after delivery;
- **Use slightly exaggerated inflection** on key points; and
- **Make use of more pauses.**

Restructuring the presentations to behave like three or four short, related, and reinforcing sub-presentations will increase the likelihood that mission-based interpretation will reach its intended audience. Interpretation is most likely to be recalled when it is aligned with what people are seeing around them. Stationing additional interpreters around a main presentation may be an effective way of addressing visitor questions and may be more effective at personally engaging them in conservation conversations.

Higher timber voices with more modulation, pauses in speech, and more inflection on key points are more easily heard. We suggest that professional actors or voice/singing coaches may be able to assist in vocal training on site. As one observer noted, the staff may benefit from thinking of the building as an instrument, like being inside a guitar or drum, and learning to play that instrument. Setting up singing exercises where interpreters sing to one another across the tank, to wait to hear what someone says, and then repeat phrases as they hear them back, (call and response) may help build skill at working with the limitations of the instrument. Voice coaching from professional actors may help presenters and educators become more skilled at using the space as an instrument.

The interpretive Toolkit shows promise as an effective way of training NEAq staff. Overall, efforts can still be made to improve staff training by:

- **Linking values will heighten the importance of each value** by integrating it into a larger principle of ethical action;
- **Incorporating the use of similes in interpretation** may help interpreters work with layered metaphors may support those who have limited scientific comprehension;
- **Invoking actionable social norms for small group behavior**, noting what communities with shared concerns are doing to *Live Blue* will help expand comprehension of the mission; and
- **Benchmarking learning outcomes against visitor entry narratives**, expectation and values will help to align outcome measures to what is possible for different audience psychographics. We note that this latter strategy will likely achieve the highest degree of measured change for those who already support the mission and may help expand the reach, rather than those who are still unclear about their conservation concern. At the time this study was completed, many visitors already felt they were acting in ways that were consistent with the mission and that the messages were not intended for their ears.

There is an opportunity to engage members more deeply with a concrete focus on local environmental action. Members who participated in focus groups commented that more could be done to engage them as activists focused on water issues nearby, including the harbor and fisheries. It is recommended that new opportunities to engage with members be identified, perhaps through campaign-based action. Findings also suggest that members can be enlisted to help prime friends and family who may be accompanying members regarding the *Live Blue* message. We suggest that presenting models of members advancing the mission, recommendations for *How to help your visiting family and friends get the most out of their visit to NEAq!*, and other techniques for situating mission-based messaging in the minds of members are all methods for leveraging the positive feelings members have for the organization.

Finally, we suggest that measures of efficacy be anchored to Diffusion of Innovation Theory (Rogers, 2003). In the context of the NEAq mission, the theory suggests that some visitors will arrive prepared to hear the core mission message and are ready to act (Early Adopters or Social Innovators), while others have not contemplated the Aquarium's mission or their role in that mission (Laggards). Development of an audience segmentation strategy based on their belief about the NEAq mission will help identify those who arrive prepared to receive or act on a mission-based message and those who have not contemplated that mission at all. This segmentation strategy will aid in identification of incremental impact for each audience type. These results suggest that NEAq may be achieving change for each visitor, but some are only starting to contemplate their role in ocean conservation while others have already taken action. The range of results represented in this study could not detect the subtle learning that is happening for those who have not considered the mission as relevant to their visit.

Conclusion

The New England Aquarium made substantial progress in achieving the intended outcomes of *A New Strategy for Visitor Engagement: Interpreting our Mission for a Changing World*, supported by the Institute of Museum and Library Services grant #MA-06-12-0143-12. With an ongoing effort in the work initiated by this project, the evaluation team believes that NEAq will continue to have success in meeting the goal of creating an interpretive approach and training model that is responsive to the Aquarium's audiences and adaptable to new exhibits; increasing visitor satisfaction through personal and positive engagement with interpreters; and increasing integration of the Aquarium's mission into the visitor experience.

NEAq has achieved its goals of aligning its brand to its mission and is well received by visitors from the community, characterized as an extension of Bostonian pride in place, values of social responsibility, and academic excellence. Respondents to the survey claimed that the NEAq brand is widely understood as concerned for the ocean, but the voice developed through this funding has achieved alignment internally, it appears that the external perception is only starting to take hold. This latter result is not surprising given that the new voice has only been actively pursued in the recent past.

Further focus on clarifying what an ocean steward (visitor) looks like will be important to helping all voices representing NEAq speak about the mission in practice. Focus on the details related to presentation structure and delivery will increase likelihood that the efforts launched through this funding will achieve their intended targets.

Overall, this evaluation concludes that the New Strategy for Visitor Engagement has laid important groundwork that aligns to the goals of the grant narrative. There remains untapped potential for engaging both members and non-members in direct local environmental action by being more explicit about the "ask" as part of the social norms of those who visit and care about nature. We suggest that practice with the techniques developed through this funding will only increase the quality and quantity of outcomes anticipated in the development of this project and its associated toolkit.

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